Notice of Allowability	Application No.	Applicant(s)	
	10/715,564	SASAKI, EISAKU	
	Examiner	Art Unit	
	Nhan T. Le	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *11/19/2003*.

2. ☒ The allowed claim(s) is/are *1-8*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 11/19/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Sean M. McGinn on 03/29/2006.

2. The application has been amended as follows:

In the claims:

Claim 4, line 15, change "interfer nc component from the a different polariz d wave" to -- interference component from the a different polarized wave --.

Claim 5, line 10, change "polariz d wav " to -- polarized wave --.

Claim 6, line 25, change "sid relativ to the self polariz d wave" to -- side relative to the self polarized wave --.

Claim 7, line 11, change "det ction sch me" to -- detection scheme -- ; line 13, change "demodulat d" to -- demodulated --.

Claim 8, lines 10, change "s lf " to -- self -- .

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

Claims 1-8 are allowed.

Regarding to claim 1, Takahashi et al (US 5,488,629) teaches signal processing circuit for spread spectrum communications comprising reception means including two RF local oscillators (see fig. 5, numbers 51, 52, col. 15, lines 35-58), demodulation means for branching each IF signals into two paths (see fig. 5, numbers 81-84, col. 15, lines 35-58, col. 16, lines 18-41) and then demodulating the respective IF signals (see col. 15, lines 35-58, col. 16, lines 18-41). Ohtsuka et al (US 4,910,468) teaches dual polarization demodulation with cross polarization cancellation comprising reception means including two RF local oscillators (see fig. 2, numbers 12, 13, col. 3, lines 8-31) which receive signals transmitted by using two orthogonal polarized waves (V and H polarized waves) and convert the respective received signals into IF (Immediate Frequency) signals (see col. 3, lines 8-31); and demodulation means and then demodulating the respective IF signals for each polarized wave by a digital coherent detection scheme (see fig. 2, numbers 4, 5, col. 3, lines 8-31). Yamamoto (US 5,327,458) teaches automatic equalizer capable of effectively canceling inter-symbol interference and cross polarization interference in co-channel dual polarization comprising the first and the second polarization received signals (see col. 3, lines 11-49) and the received signal are demodulated into the first and the second demodulator (see col. 4, lines 19-49). The teaching of these prior arts either combine or alone fails to teach wherein the demodulation means for each polarized wave extracts a phase noise component from a demodulated output signal, divides the component into DC and AC components, and suppresses a phase noise amount received from an RF local oscillator for an orthogonally polarized wave (different polarized wave) relative to a

polarized wave (self polarized wave) as a compensation target in the demodulation means for each polarized wave by using a phase control signal obtained by interchanging the DC and AC components between the respective polarized waves.

Dependent claims 2-5 are allowable for the same reason.

Regarding to claim 6, Takahashi et al (US 5,488,629) teaches signal processing circuit for spread spectrum communications comprising first and second RF (Radio Frequency) mixers (see fig. 5, signals into 41, 42, col. 15, lines 40-58) which convert signals transmitted by using two orthogonal polarized waves (V polarized wave and H polarized wave) into IF (Immediate Frequency) signals; first and second RF local oscillators (see fig. 5, 51, 52, col. 15, lines 40-58) which are phase-controlled by a common reference signal; a common IF local oscillator and first and second IF mixers (see fig. 5, numbers 51, 41, 42, col. 15, lines 40-58, col. 16, lines 18-41) which branch each IF signal into two paths and perform digital coherent detection for each of the IF signals for each polarized wave; first and second A/D converters (see fig. 5, 71, 72, col. 15, lines 40-58) which convert the respective signals having undergone digital coherent detection into digital signals; first and second demodulation circuits which demodulate the respective converted signals. Ohtsuka et al (US 4,910,468) teaches dual polarization demodulation with cross polarization cancellation comprising first and second RF (Radio Frequency) mixers (see fig. 2, main signal, cross polarization signal, col. 3, lines 8-31) which convert signals transmitted by using two orthogonal polarized waves (V polarized wave and H polarized wave) into IF (Immediate Frequency) signals; first and second RF local oscillators (see fig. 2, numbers 12, 13, col. 3, lines 8-31) which

are phase-controlled by a common reference signal; first and second A/D converters (see fig. 2, numbers 14, 15, col. 3, lines 8-31) which convert the respective signals having undergone digital coherent detection into digital signals; first and second demodulation circuits (see fig. 2, numbers 4, 5, col. 3, lines 8-3) which demodulate the respective converted signals. Yamamoto (US 5,327,458) teaches automatic equalizer capable of effectively canceling inter-symbol interference and cross polarization interference in co-channel dual polarization the first and the second polarization received signals (see col. 3, lines 11-49) and the received signal are demodulated into the first and the second demodulator (see col. 4, lines 19-49), an equalizer (see fig. 2, number 20, col. 4, lines 19-49) which equalizes a waveform of a demodulated signal of a polarized wave (self polarized wave) as a compensation target. The teaching of these prior arts either combine or alone fails to teach an XPIC (Cross-Polarization Interference Canceller) which generates a replica signal of an interference component from a different polarized wave with respect to a demodulated signal on a different polarization side relative to the self polarized wave; an adder which outputs a demodulated signal by adding an error signal output from the equalizer to a replica signal output from the XPIC; a control circuit which generates an APC (Automatic Phase Control) signal corresponding to a shift of a carrier frequency from the demodulated signal and outputs the signal to the first demodulation circuit on the self polarization side; a divider which divides the APC signal into DC and AC components; and a combiner which generates a phase control signal by interchanging an AC component output from a divider for the

other polarized wave between the two polarized waves, and outputs the signal to the second demodulation circuit on the different polarization side.

Regarding to claim 7, Takahashi et al (US 5,488,629) teaches signal processing circuit for spread spectrum communications comprising the first step of converting signals transmitted by using the two orthogonal polarized waves into IF signals (see fig. 5, numbers 51, 52, col. 15, lines 35-58), the second step of branching each IF signals into two paths and then demodulating the respective IF signals (see col. 15, lines 35-58, col. 16, lines 18-41). Ohtsuka et al (US 4,910,468) teaches dual polarization demodulation with cross polarization cancellation comprising the first step of converting signals transmitted by using the two orthogonal polarized waves into IF signals (see fig. 2, numbers 12, 13, col. 3, lines 8-31) which receive signals transmitted by using two orthogonal polarized waves (V and H polarized waves) and convert the respective received signals into IF (Immediate Frequency) signals (see col. 3, lines 8-31); and the second step of demodulating the respective IF signals (see fig. 2, numbers 4, 5, col. 3, lines 8-31). Yamamoto (US 5,327,458) teaches automatic equalizer capable of effectively canceling inter-symbol interference and cross polarization interference in co-channel dual polarization comprising the first step of converting signals transmitted by using the two orthogonal polarized waves into IF signals (see col. 3, lines 11-49) and the second step of demodulating the IF signals (see col. 4, lines 19-49). The teaching of these prior arts either combine or alone fails to teach the third step of extracting a phase noise component from the demodulated output signal and dividing the component into DC and AC components; the fourth step of generating a phase control signal by

receiving an AC component of the other polarized wave and interchanging the AC components between the two polarized waves; and the fifth step of generating a replica signal of an interference component from a different polarized wave for a demodulated signal on a different polarization side relative to a self polarized wave on the basis of the phase control signal in order to suppress a phase noise amount received from an orthogonally polarized wave (different polarized wave) relative to a polarized wave (self polarized wave) as a compensation target.

Dependent claim 8 is allowable for the same reason.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Le whose telephone number is 571-272-7892. The examiner can normally be reached on 08:00-05:00 (Mon-Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on 571-272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

N. Le

Nhan Le

4/3/2006

NGUYEN T. VO
PRIMARY EXAMINER